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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,840	09/05/2003	William A. Moffatt	1008-US	8406

7590 09/17/2007
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EXAMINER

STOUFFER, KELLY M

ART UNIT	PAPER NUMBER
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1762

MAIL DATE	DELIVERY MODE
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09/17/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/656,840

Applicant(s)

MOFFATT ET AL.

Examiner

Kelly Stouffer

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-23 and 25-50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-23 and 25-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6 August 2007 has been entered.

Response to Arguments

2. Applicant's arguments filed 17 July 2007 are moot in view of the new grounds of rejection. However, the following arguments will be answered, as they are deemed relevant to the new ground of rejection.

The applicant argues that Loan et al. does not teach "coating said substrate with said first chemical". Though Loan et al. cites examples of using precursors to coat the substrate in its disclosed method, Loan et al. also describes a precursor being delivered to a substrate in a pure form and limiting decomposition of the precursor (column 3 lines 38-65). One of ordinary skill in the art would recognize that if it were desirable, this method could then be used to deposit the precursor on the substrate using the method of Loan et al. It is also noted that during a CVD process, it is common that the

precursor may be deposited on the surface of the substrate to react with another precursor, therefore forming the resultant film.

In addition, the applicant argues that silane is taught by Loan et al. in reference to the prior art. This is agreed upon by the examiner, and the statement that silane may be used as a precursor in the process of Loan et al. is made to the extent that it is known to use silane in a CVD process.

The applicant further argues that Loan does not teach nitrogen as an inert gas, but argon. It is the examiner's position that it is well known in the art to substitute nitrogen with argon, as they both possess the same function as an inert gas in CVD processes. The claim would have been obvious because the substitution of one known element for another (i.e. nitrogen for argon) would have yielded predictable results to one of ordinary skill in the art at the time of the invention. See *KSR International Co. v. Teleflex Inc.*, 550 U.S.--, 82 USPQ2d 1385 (2007). To support this argument, see Bunshah et al. "Deposition Technologies for Films and Coatings: Developments and Applications" page 339 et seq.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 20-23, 25-40, and 46-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loan et al. (US 6,136,725).

Loan teaches a method in which a CVD process is performed in a process chamber. The reactants are fed into vaporization chambers prior to being fed into the process chamber (abstract). Each reactant may have its own vaporizer chamber (column 5, lines 30-36). The pressure is adjusted for each process step (column 13, lines 22-39). This reads on the second pressure being higher or lower than the first

pressure. The inert gas is taught (column 7, lines 60-67). Silane is taught to be one of the reactants (column 2, lines 5-15).

Loan et al. teaches supplying a first chemical to a process chamber to coat the substrate with a first chemical as follows. Loan et al. describes a precursor being delivered to a substrate in a pure form and limiting decomposition of the precursor (column 3 lines 38-65). One of ordinary skill in the art would recognize that if it were desirable, that it would be obvious to use this method to deposit the precursor on the substrate using the method of Loan et al. to create a film of the precursor. It is also noted that during a CVD process, it is common that the precursor may be deposited on the surface of the substrate to react with another precursor, therefore forming the resultant film. This would still include the chemical that was the precursor, and therefore still reads on this limitation.

The dehydrating step is disclosed by Loan as follows. Loan teaches that the chamber is evacuated and purged with an inert gas repeatedly (column 15 lines 49-67 and column 16 lines 1-6) either during a processing state or a standby state. The pressure of the inert gas is approximately 50 torr, which would be well beyond the pressure needed to evaporate water at below room temperature. This reads on the dehydration step; according to the applicant's own specification (paragraph 0054) where the substrate is exposed alternately to heated nitrogen and a vacuum. As the only purpose of the heated nitrogen is to assist in the dehydration process, it is a result effective variable dependant upon pressure in the chamber as one of ordinary skill in the art would recognize that 50 torr as taught by Loan is more than sufficient to dehydrate the

chamber. However Loan teaches using Argon in this section rather than nitrogen as taught in the instant specification. It is the examiner's position that it is well known in the art to substitute nitrogen with argon, as they both possess the same function as an inert gas in CVD processes. The claim would have been obvious because the substitution of one known element for another (i.e. nitrogen for argon) would have yielded predictable results to one of ordinary skill in the art at the time of the invention. See *KSR International Co. v. Teleflex Inc.*, 550 U.S.--, 82 USPQ2d 1385 (2007). See Bunshah et al. "Deposition Technologies for Films and Coatings: Developments and Applications" page 339 et seq. for further support.

As to claims 27 and 49, Loan teaches the limitations above, but is silent to the inert gas being nitrogen. However, nitrogen (N₂) is a known inert gas. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize nitrogen in the process taught by Loan. By doing so, one would have a reasonable expectation of success, as Loan teaches the use of an inert gas and nitrogen is a known inert gas. It is the examiner's position that it is well known in the art to substitute nitrogen with argon, as they both possess the same function as an inert gas in CVD processes. The claim would have been obvious because the substitution of one known element for another (i.e. nitrogen for argon) would have yielded predictable results to one of ordinary skill in the art at the time of the invention. See *KSR International Co. v. Teleflex Inc.*, 550 U.S.--, 82 USPQ2d 1385 (2007).

As to claims 23 and 47, Loan teaches the limitations above, but is silent to the reservoir being the manufacture's source bottle. However, it is explicitly taught that the chemicals used as the precursors have a low vapor pressure (low tendency to evaporate under atmospheric pressures) (column 2, lines 30-40). It is also taught that the invention is not sensitive to gas or solids that may get absorbed into the chemicals (column 1, lines 40-67). From this, one of ordinary skill would understand that no special reservoir is required for the process. Additionally, since chemicals would come from the manufacturer already in a container that is suitable for holding the specific chemical, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the manufacturer's own source bottle in the process taught by Loan. By doing so, one would have a reasonable expectation of success, as Loan makes obvious that no special reservoir is required and the manufacturer would already provide a bottle that is suitable for holding the specific chemical contained within.

4. Claims 41-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loan et al. (US 6,136,725), as applied to claims above, and further in view of the applicant's admitted prior art.

Loan teaches the process above is pertinent for reactants with low volatility, but is silent to using amino silanes and other specific silanes claimed by the applicant. However, the applicant admits that it is well known in the art to deposit amino, mercapto, or epoxy silanes to glass substrates and that the reactants have low volatility

(paragraph 10). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the reactants is substrates claimed by the applicant in the process taught by Loan. By doing so, one would have a reasonable expectation of success, as the process taught by Loan is best for low volatile reactants and the applicant admits that these reactants are known and have low volatility.

5. Claim 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Loan et al. (US 6,136,725), as applied to claims above, and further in view of Uhlenbrock et al. (US 6,214,729 B1).

Loan teaches the limitations above, but is silent to using a syringe pump. However, Uhlenbrock teaches the art recognized suitability of using a syringe pump to pick up the liquid feed and deliver it to a vaporizer (figure 1; example 1). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize a syringe pump in the process taught by Loan. By doing so, one would have a reasonable expectation of success, as Loan teaches delivering a liquid to a vaporizer and Uhlenbrock teaches the art recognized suitability of using a syringe pump to do so.

Conclusion

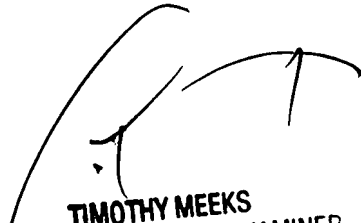
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kelly Stouffer whose telephone number is (571) 272-2668. The examiner can normally be reached on Monday - Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kelly Stouffer
Examiner
Art Unit 1762

kms


TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER